SCHENNE & ASSOCIATES

ENGINEERS, ARCHITECTS, and GEOLOGISTS

U.S. Environmental Protection Agency
Region 2
290 Broadway, 25th Floor
New York, NY 10007-186

Attn.: Mr. Robert Hargrove

Re: Environmental Review
Seneca Nation Senior Housing Complex
Alleghany Reservation, Salamanca, NY

May 12, 1999

Dear Mr. Hargrove:

Last year our firm was hired to investigate a subsidence problem at the above referenced property owned by the Seneca Nation of Indians. After a review of historical records we determined the property had been used for approximately 100 years as a tannery site for making shoe leather. Our investigation included excavation of six test pits, four soil borings, and collection of soil and water samples. The results of this investigation are described in the enclosed report.

Currently the Housing Authority wishes to demolish that portion of the facility that has experienced serious settlement. Our investigation revealed a buried wooden process vat filled with liquid and sludge approximately 40 feet from the proposed work. We have recommend that the vat and its contents be removed prior to demolition operations so that contaminates contained in the vat do not leach in the surrounding ground during construction operations. The vat will be removed by a licensed remediation contractor in compliance with all Federal, Seneca Nation, State, and local laws.

The removal of the Vat and the Demolition would be accomplished using funding from the U.S. Department of Housing and Urban Development, which requires an environmental review of the proposed project by Federal, State and Local Agencies. Since this project is on Seneca Nation Land and falls within the jurisdiction of EPA Region 2, I am requesting your agency review the proposed work and provide me with any comments you may have.

If you require any additional information please contact me. Thank you for your time

Sincerely,

John Schenne, PE

Enc.

967 LUTHER ROAD EAST AURORA NEW YORK 14052 (716) 655-4991

SUBSURFACE SITE INVESTIGATION

SENIOR CITIZEN HOUSING COMPLEX
44 SENECA STREET
SALAMANCA, NEW YORK

August 1998

PREPARED FOR

SENECA NATION HOUSING AUTHORITY
44 SENECA STREET
SALAMANCA, NEW YORK

PREPARED BY

SCHENNE & ASSOCIATES
ENGINEERS, ARCHITECTS, & GEOLOGISTS
967 LUTHER ROAD
EAST AURORA, NEW YORK 14052
(716)-655-4991

SUBSURFACE SITE INVESTIGATION
Seneca Nation Housing Authority
44 Seneca Street
Salamanca, New York

PREPARED FOR:
Seneca Nation Housing Authority
44 Seneca Street
Salamanca, New York

PREPARED BY:
Schenne & Associates
East Aurora, New York

June 1998
File No. 55203

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APPENDICES

1.0 INTRODUCTION

Schenne & Associates (S&A) has completed a site investigation regarding soil and groundwater sampling at Seneca Nation Housing Authority site located at 44 Seneca Street in the City of Salamanca. The scope of services included collection of soil and water samples and analytical testing of selected samples and geotechnical evaluation of the soils to determine the causes of subsidence at various locations on the site.

1.10 Site Description

The site is located on the North side of Wildwood Avenue and extends approximately 600 feet East of Seneca Street in the City of Salamanca. An area map depicting the project location is provided as Figure 1.

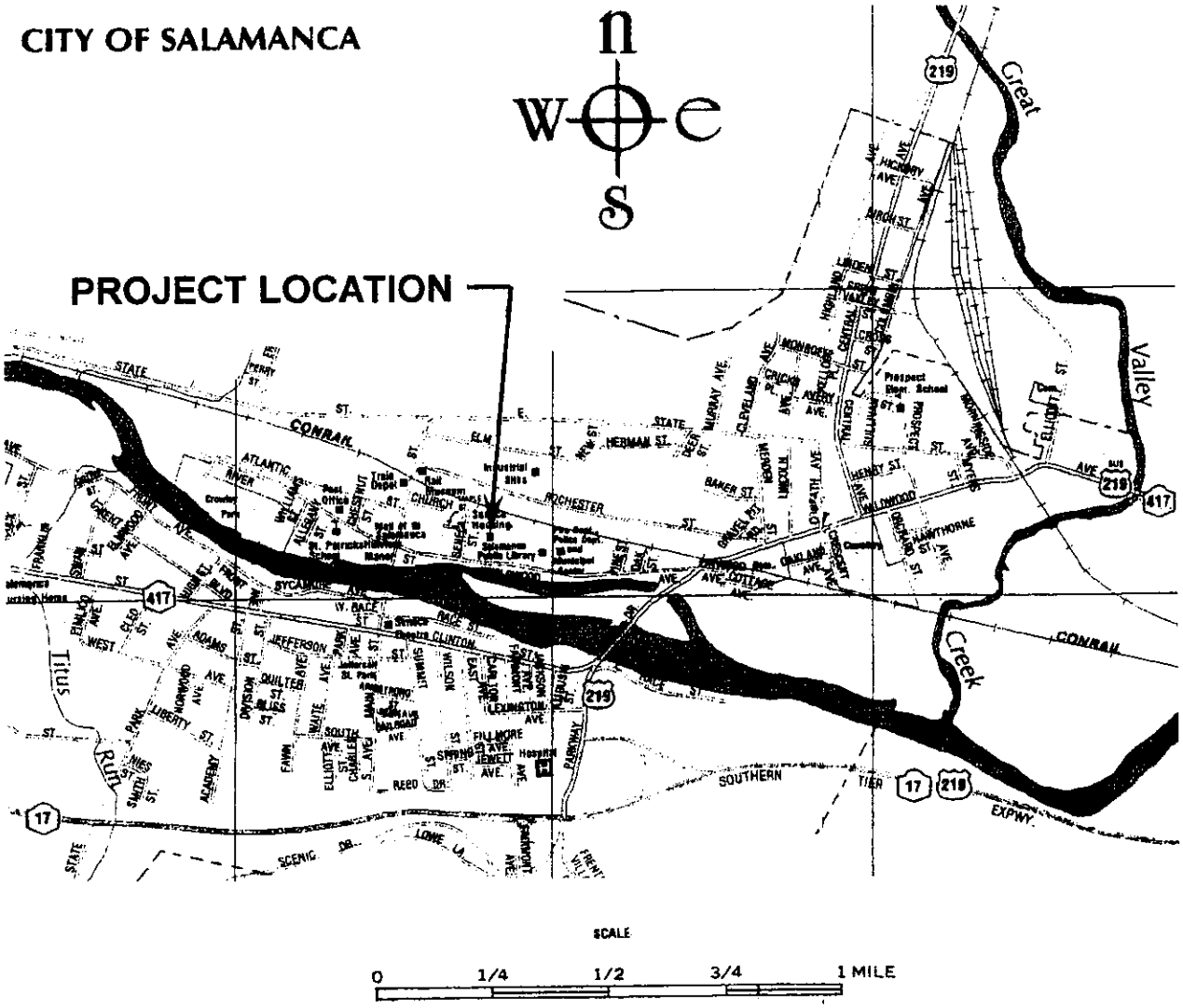
Currently the site is used for residential use as a Senior Citizen Housing Complex. A single story slab on grade 50,000 S.F. wood frame building along with associated site improvements was constructed in 1979-1980 and currently is in use. A portion of the existing structure referred to as the Northeast Wing has been vacant for some time due to settlement problems with the floors. Subsidence of soils beneath the Northeast Wing has caused the floor slabs to settle differentially as much as six inches. This has rendered the affected apartment units uninhabitable.

The original design drawings and soil borings are maintained and are available from the Seneca Nation Housing Authority (SNHA). A search of City of Salamanca records revealed the Zoning Department has a copy of the original US Leather Company Tannery Site Plan from 1909. Information from this map pertaining to the Senior Housing Site is presented in Figure 2.

1.20 Background

The Seneca Street property was used as a tannery site from the 1860's to approximately 1950 according to local records. Starting in 1860 work was begun on the site and by 1863, the firm of Curtis & Demming had constructed a 20 acre tannery complex containing a number of large buildings, several rail sidings, and 320 leather processing vats. Initially, power for the facility was produced by an 80 horse-power steam engine. Large quantities of Hemlock and Oak bark were used to obtain tannic acid for the leather making process. The plant consumed in excess of 3,000 chords of bark per year in the 1860's. After a few years of operation, stocks of locally available Oak and Hemlock trees were exhausted and bark had to be shipped in by rail.

Over the years the facility expanded, increased capacity and employed up to 200 people. By the early 1900's it was operated by the U.S. Leather Company to produce shoe leather and consisted of over thirty (30) buildings and large storage yards. The plant was built parallel to Wildwood Avenue and extended to the over 2,000 feet East of Seneca Street.



PROJECT LOCATION MAP

Figure 1

All of the land currently occupied by the Seneca Nation Housing Authority and the adjacent City of Salamanca property falls within the original plant area.

S&A has overlain the existing SNHA Senior Housing complex on a site plan produced by the U.S. Leather Company in 1909 and the overly is shown in Figure 3. The red and blue lines in this figure represent the current SNHA site and the black lines show the buildings as they were in 1909. Although the 1909 site plan was in poor condition, this overlay clearly shows the current building was built in an area previously occupied by process buildings, rail sidings, and storage buildings. It should be noted that locations of the tannery buildings and their relation to the current structures as shown in this figure are approximate.

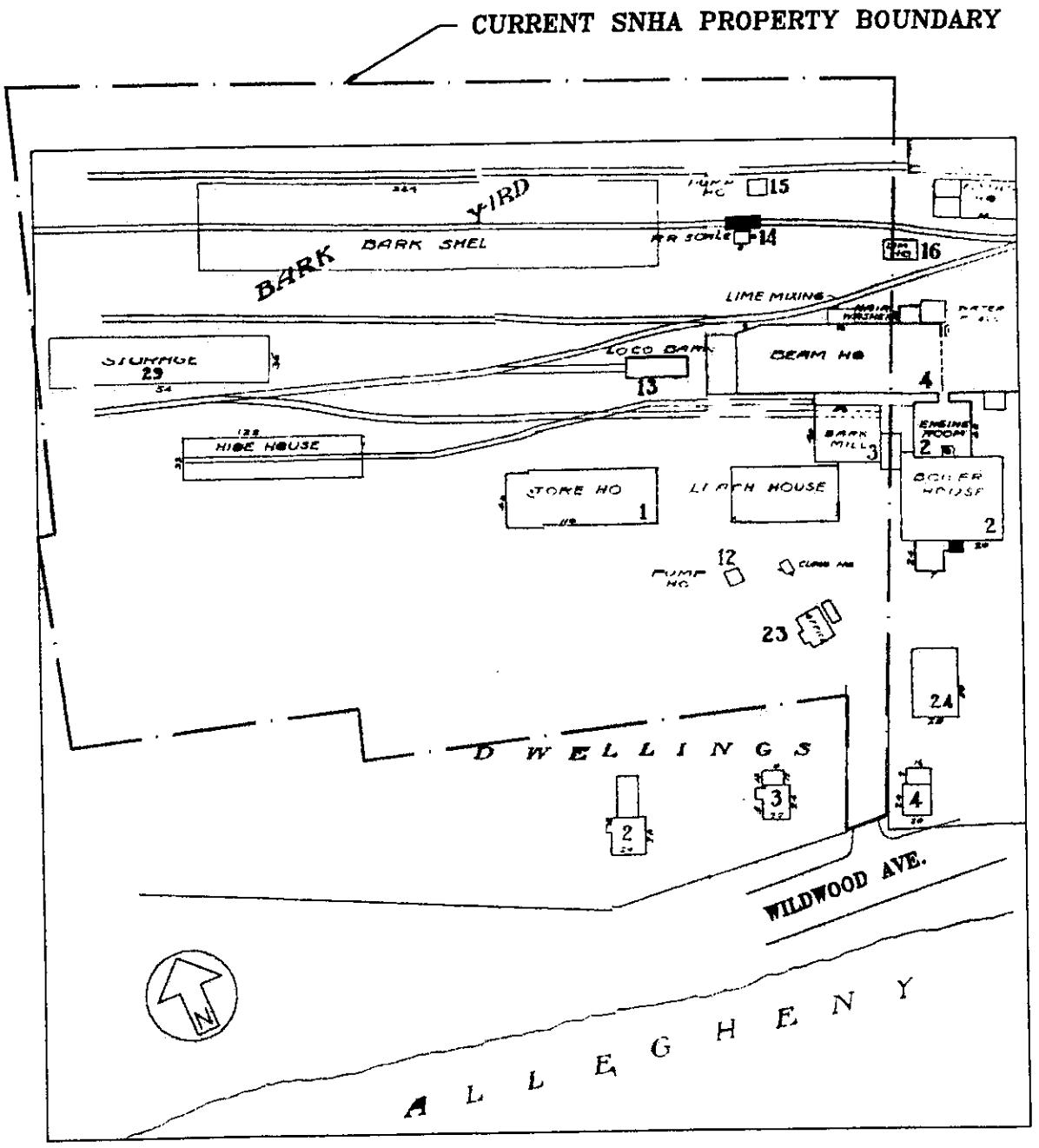
The basic tanning process changed little over the years, requiring large amounts of water and tannic acid. At its peak this plant produced over 6,000,000 pounds of leather annually and employed approximately 150 people. Production at the plant continued at a high rate into the 1940's and by 1950, when it was closed due to the introduction of Neolite, a synthetic substitute for shoe sole.

The site plan depicted in Figure 2 presents several interesting features including:

- The presence of a pump house in the southeast parking lot that coincides with an area that currently has experienced settling;
- The Northeast Wing of the building which has experienced subsidence of the floor slabs appears to have been built over what was called the "Beam House". Although research by S&A found no description of this building, it was likely a process building using "walking beam-type" agitation equipment to mix process liquids;
- South of the Beam House was a bark mill. This area currently is used for parking;
- The entire site was connected with a number of rail sidings and included a building for storing the company locomotive.
- The large amounts of process water required an extensive network of site water supply and waste lines. The original site plan shows some of these utilities, however they have not been included in Figure 2 for clarity.
- A large Boiler House and electrical generator building were located off-the SNHA site to the East where power for the complex was generated.

1.30 Purpose

The purpose of the work described herein was to assess the soil and groundwater quality at the site, to evaluate potential health and environmental risks to users of the site, (e.g., residential use) and to identify the causes of unusual subsidence and sinkhole formation on the site.



1909 SITE PLAN OF THE U.S. LEATHER TANNERY SITE

TANNERY INFORMATION TAKEN FROM PLAN OF THE SALAMANCA TANNERY, U.S. LEATHER COMPANY DATED 1909, REVISED MAY 1920

FIGURE 2

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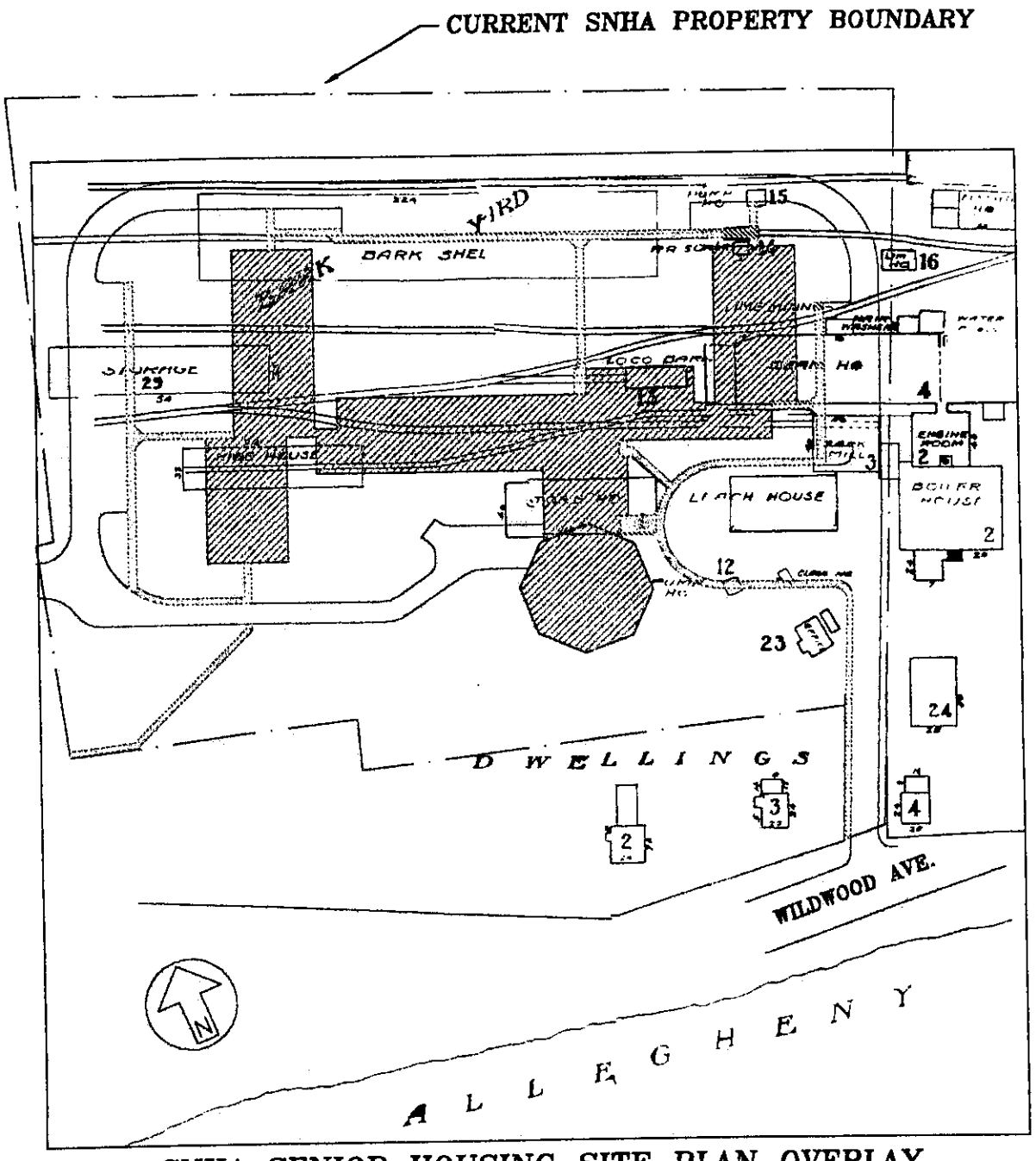

SNHA SENIOR HOUSING SITE PLAN OVERLAY
OF THE U.S. LEATHER TANNERY SITE

TANNERY INFORMATION TAKEN FROM PLAN OF THE SALAMANCA TANNERY, U.S. LEATHER COMPANY DATED 1909, REVISED MAY 1920

FIGURE 3

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2.0 FIELD WORK

2.10 Test Borings and Wells

The boring locations were selected both as locations to obtain samples for analytical testing and to assess geotechnical properties of the soils underlying the site. Initially only two observation wells (OW-1 and OW-2) were planned to be installed for further groundwater monitoring, but due to the discovery of a process vat, a third monitoring well was installed (OW-3) on the East side of the site.

S&A retained Earth Dimensions, Inc. (EDI) of Elma, New York for the completion of borings and installation of the observation wells. EDI performed the soil sampling using a drilling rig at 4 locations as agreed to by SNHA. Continuous soil samples were collected using a 2-inch O.D. split spoon sampler in accordance with ASTM D-1586. EDI installed 3 monitoring wells (2-inch PVC slotted wells) in selected borings to collect groundwater samples (see Figure 4 for well and boring locations). Test boring logs and well installation reports are included in Appendix A.

The soil and groundwater samples collected by S&A were placed in clean jars for potential analytical testing. Selected soil samples were tested for USEPA Methods 8240, 8270 and TAL Metals. The soil samples were collected directly from the split spoon using a stainless steel spoon. The spoon was cleaned between samples using detergent and water followed by a distilled water rinse.

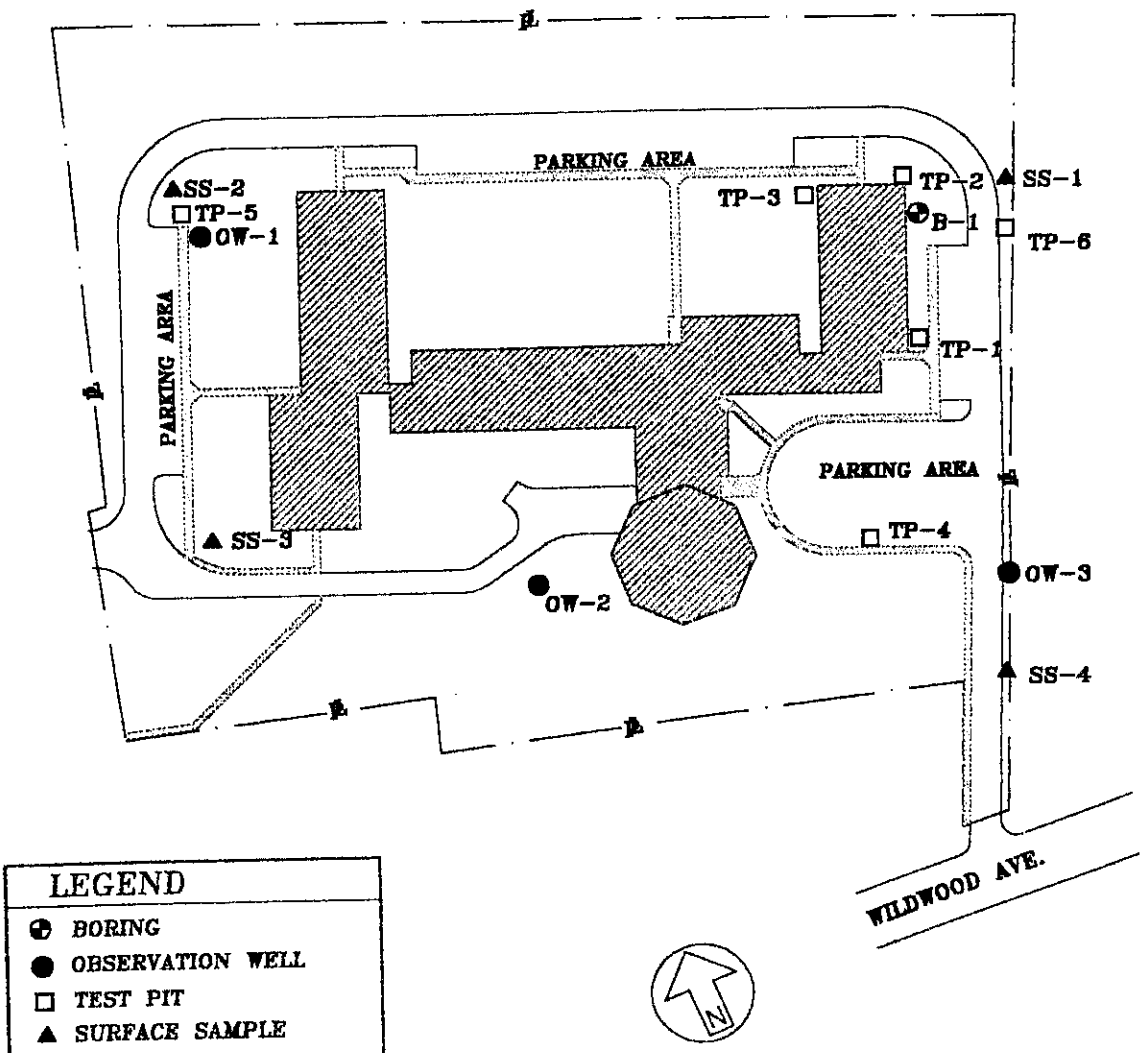
Groundwater samples were collected from wells set at locations OW-1, and OW-2. The samples were collected utilizing separate stainless steel bailers for each well. The water samples were collected after purging the wells of three standing water volumes. The samples were placed into clean containers provided by the laboratory. The samples were then placed on ice and sent to the laboratory for analysis using the USEPA Methods 8240, 8270 and TAL Metals.

2.20 Test Pits

Six (6) test pits were excavated at the locations indicated on Figure 4. These test pits were excavated approximately 9 to 12 feet deep using a Case 580E rubber tired backhoe to allow for the collection of soil samples and allowed for a visual inspection of the soil profile. The test pit locations were chosen at or near areas where subsidence was observed. Selected soil samples were tested for USEPA Methods 8240, 8270 and TAL Metals. The Test Pits Logs are included in Appendix B.

2.30 Surficial Soil Samples

Surficial soil samples were collected by S&A on July 16, 1998 at four locations (SS-1 to SS-4). The samples were collected to better assess whether the contaminants detected in subsurface soils were also present in the surficial soils. The samples were collected using a



LEGEND

- BORING
- OBSERVATION WELL
- TEST PIT
- SURFACE SAMPLE
- PROPERTY LINE

SNHA SENIOR HOUSING SITE AND SAMPLE LOCATION PLAN

FIGURE 4

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TEST PIT-4 LOOKING SOUTHEAST

TEST PIT 4 SOIL PROFILE LOOKING SOUTHEAST

FIGURE 5

stainless steel spoon. The spoon was cleaned between samples using detergent and water followed by a distilled water rinse.

Soil was obtained from a depth of 0 to 12" below ground surface. Care was taken to avoid vegetation and roots. The samples were placed into containers provided by the laboratory. Selected soil samples were tested for USEPA Methods 8270 Poly nuclear aromatic hydrocarbons (PAHs only) and 8080 PCBs.

3.00 RESULTS

3.10 Soils

In general, the soils from the ground surface down are summarized as follows.

- Asphalt is present across the site except where the building is present.
- Fill includes brick, clay tile, concrete, glass, metal, wood, ash, cinders, and various types of discolored soils extending in some cases to depths in excess of 10 feet were encountered below the ground surface. Based upon the work completed, much if not all of the site appears to have been used for disposal of demolition debris. Brick building foundations were encountered at a depth of eight feet in TP-4, and a process vat complete with mixing arms from the former tannery was encountered at 2.0 feet below the surface at TP-6.

  It is likely that further excavations would encounter substantial quantities of demolition debris and additional building foundations. At present, the extent of the buried process vats is unknown, they likely extend to the East off-site onto lands used by the City of Salamanca.
- Apparent natural sands and gravels were encountered across the site beneath the fill materials.
- The natural water table was approximately 20 to 24 feet below the ground surface

A review of Figure 2 and 3 shows that the Northeast Wing of the building was built in the location of the former "Beam House". Test pits were excavated around this wing and although quantities of demolition debris were encountered in TP-1, 2 and 3, no building foundations were discovered. Many pieces of iron including several old empty corroded 55 gallon drums were found in TP-1. From the soils excavated at these three test pits, it appeared that both gravel and demolition debris were used as backfill during the foundation excavations for the Senior Housing Complex in this area of the site.

TP-4 was located at the southeast side of the site in the parking area where a sink hole had developed (See Figure 5). Several inches of asphalt paving were encountered followed by approximately 6" of gravel base which was underlain by 6 feet of demolition debris. This demolition debris included a black compressible soil material (i.e., a pocket penetrometer indicated that the material had a bearing capacity of less than 0.25 tons per square foot).

TEST PIT-6 LOOKING EAST

TEST PIT 6 SOIL PROFILE LOOKING SOUTHEAST

FIGURE 6

This material appeared to be a loose mixture of soil and ash.

Also, a 12 inch thick brick masonry foundation was encountered at TP-4 six feet below grade. This foundation extended down at least an additional four feet (4') and was oriented along a North-South axis. As can be seen in Figure 2, two buildings previously existed in this area, a Clock House and a Pump House. When these structures were demolished, the area around them appears to have been filled with demolition debris. Over time the compressible portions of this material has apparently consolidated allowing a "sinkhole" to form at the surface. It is also possible, that the supply or drainage piping or other subsurface cavities from the tanning works may still be in-place allowing soil to migrate into these voids. At the completion of the test pit work, TP-4 was backfilled with excavated material to the level with the existing pavement. Currently the backfill material has subsided approximately 18 inches.

TP-5 was located adjacent to the dumpster pad near the Northwest corner of the site. Subsidence here has caused the dumpster pad to settle in excess of one foot. The test pit excavation revealed several feet of soil fill covering approximately 4' of partially decomposed timbers and rough cut hemlock siding. The buried wood appears to extend under the sidewalk, dumpster pad and parking area. Below the six foot level, the soil appeared to be undisturbed sands and gravels.

At TP-6 on the East side of the building, a process vat complete with portions of a "walking beam" mixing system was encountered about sixty feet from the edge of the building and buried under 24" of debris and fill. This 8 foot wide by 5 foot deep vat extended to the West under the existing access drive, an unknown distance and to the east onto lands occupied by the City of Salamanca an unknown distance. See photographs in Figure 6.

The vat walls were constructed of 2" thick timber, and appeared sound and watertight. The vat was uncovered and was full of a black colored water and the bottom had an unknown quantity of sludge in it. The four inch thick timber decking which had been placed on top of the vat was deteriorated and had little structural strength. This decking extends under the present SNHA access driveway and appears to have partially failed in some areas apparently causing the subsidence in the pavement above, as seen in Figure 6. This decking is at least fifty years old and could fail at any time especially when subjected to traffic loads.

Further exploration of the area in and around the vat was not attempted due to the porous nature of the surrounding ground and the unknown condition of the vat and the liquids which it contained. Samples of the liquid and sludge, contained in the vat, were collected and the results of these analyses are presented in Sections 3.11 and 3.12.

3.11 Soil Contamination

Results of soil samples are summarized on Table 1. The analytical laboratory reports are contained in Appendix B. The surficial soil samples show that polynuclear aromatic hydrocarbons (PAHs) are present at three of the four sample locations. The concentration of the PAHs are on the order of 1000 micrograms per kilogram (ug/kg). PCBs were not detected in the surficial soil samples.

The results show that volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), metals, and PCBs were detected in the subsurface soil samples. The VOCs detected are of limited concern. The VOCs were detected at levels that are relatively low, and they are typically associated with laboratory contamination with the exception of toluene. The toluene level is below NYSDEC soil cleanup criteria for petroleum spills[1].

The subsurface soil samples showed that SVOCs mainly PAHs were detected at levels exceeding soil cleanup criteria for petroleum spills. The soil samples from the subsurface soils are considered to be of limited concern given that the groundwater samples did not show the compounds present. However, excavation into the soils could present health risks to human and animal health if the soils are ingested or dust particles are inhaled. Thus, if the soils are excavated into or moved, then a risk assessment should be completed or the soils should be properly disposed.

Some metals were detected at levels that are in excess of the potential cleanup levels. However, in general, the levels between samples did not vary widely. However, to better assess potential impacts of metals on human and animal health, site background should be assessed.

PCBs were detected in the soil sludge sample from TP-6 at a concentration of 4000 ug/kg. The levels are not considered a significant threat to human health or the environment, if the PCBs are not moved or contacted[2].

3.20 Groundwater

Groundwater appears to exist in the sand and gravel layer beneath the fill materials. The apparent direction of flow is towards the Allegheny River to the South. Based upon this apparent direction of flow, well OW-2 is considered downgradient of the site, and OW-1 is considered upgradient. (See Figure 4) OW-3 was not tested at this time but is also considered to be downgradient of the site.

---

[1] The soil cleanup levels referenced are from the NYSDEC's STARS Memo #1 for Underground Storage Tank closure. If the contaminant levels are below the STARS cleanup levels for an UST site, the NYSDEC will close the site and provide a "no further action" letter. While this is not an UST Site, it appears reasonable to utilize the guidance criteria as a guide for assessing potential risks posed by the contaminants.

[2] This guidance value was obtained from the NYSDEC TAGM 4046 for inactive hazardous waste sites.

PARAMETERS	NYSDEC	Surficial Soils				Subsurface Soils					Remarks
		SS-1	SS-2	SS-3	SS-4	OW-1	TP-1	TP-3	TP-4	TP-6	
TAL Metals	Potential Cleanup Levels[1&2]					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Aluminum	SB	NT	NT	NT	NT	5800	7800	5400	8600	6500	See Note 1
Antimony	SB	NT	NT	NT	NT						See Note 1
Arsenic	7.5 or SB	NT	NT	NT	NT	9.4	9.7	3.7	12	6.8	See Note 1
Barium	300 or SB	NT	NT	NT	NT	66	180	62	150	260	See Note 1
Beryllium	0.16 or SB	NT	NT	NT	NT					1.8	See Note 1
Cadmium	1 or SB	NT	NT	NT	NT	3.9	6.2	4.8	6.8	6.8	See Note 1
Calcium	SB	NT	NT	NT	NT	22000	18000	2000	4700	4800	See Note 1
Chromium	10 or SB	NT	NT	NT	NT	9.4	9.7	7.8	15	14	See Note 1
Cobalt	30 or SB	NT	NT	NT	NT			6.2			See Note 1
Copper	25 or SB	NT	NT	NT	NT	16	56	20	26	26	See Note 1
Iron	2000 or SB	NT	NT	NT	NT	11000	16000	14000	17000	18000	See Note 1
Lead	250 or SB	NT	NT	NT	NT	18	95		130	140	See Note 1
Magnesium	SB	NT	NT	NT	NT	1600	2500	1500	1800	2400	See Note 1
Manganese	SB	NT	NT	NT	NT	570	450	590	1100	380	See Note 1
Mercury	0.1	NT	NT	NT	NT		2.7	7.4		0.39	See Note 1
Nickel	13 or SB	NT	NT	NT	NT	7.7	12	14	12	11	See Note 1
Potassium	SB	NT	NT	NT	NT	460	430	440	540	370	See Note 1
Selenium	2 or SB	NT	NT	NT	NT		0.32		0.68	0.18	See Note 1
Silver	SB	NT	NT	NT	NT			0.15			See Note 1
Sodium	SB	NT	NT	NT	NT	130	180	65	85	100	See Note 1
Thallium	SB	NT	NT	NT	NT	0.83	0.83				See Note 1
Zinc	20 or SB	NT	NT	NT	NT	43	190	87	150	270	See Note 1
EPA Method 8260	ug/kg					ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
Methylene chloride	100	NT	NT	NT	NT	13	16	4	11	11	Common lab contaminant. See Note 1
Acetone	200	NT	NT	NT	NT			89			Common lab contaminant. See Note 1
Carbon Disulfide	2,700	NT	NT	NT	NT			4			Common lab contaminant. See Note 1
Toluene	100	NT	NT	NT	NT					66	See Note 2
EPA Method 8270	ug/kg					ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
Naphthalene	13,000	680									
Phenanthrene	1000		1100			980	2800			1600	See Note 2
Fluoranthene	1000		1200			1300	2500			2300	See Note 2
Pyrene	1000		1200	440		1600	2800			2200	See Note 2
Benzo(a)anthracene	0.04		460			570	960			840	See Note 2
Chrysene	0.04		530			680	1100			890	See Note 2
bis (2-Ethylhexyl) phthalate	50,000					1000			740		Common lab contaminant. See Note 1
Benzo(b) fluoranthene	0.04		710			1100	1400			1400	See Note 2
Benzo (k) fluoranthene	0.04					490	550			570	See Note 2
Benzo (a) pyrene	0.04		450			620	840			880	See Note 2
EPA Method 8080 PCBs	ug/kg					ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
Total PCBs	10,000									4000	See Note 1

Notes:

1. Cleanup levels for indicated compounds from NYSDEC TAGM 4046 for Inactive Hazardous Waste Sites. SB means site background. PCBs cleanup level from the same document. PCBs in surficial soils are required to be cleaned to less than 1,000 ug/kg.
2. The cleanup levels for indicated VOCs and SVOCs from the NYSDEC Petroleum-Contaminated Soil Guidance Policy STARS Memo # 1.
3. Only compounds detected in at least one soil sample are presented.
4. Blank means compound not detected. Refer to the analytical report.

Table 2
SUSURFACE SOIL INVESTIGATION

WATER SAMPLE RESULTS

PARAMETERS	Groundwater Quality Standard	TP-6[3] Vat	OW-1	OW-2	Remarks
[illegible]	mg/l	mg/l	mg/l	mg/l	
Aluminum	NA	130	52	180	
Antimony	NA	0.044			
Arsenic	0.025	0.073	0.007	0.011	
Barium	1	6.9	1.1	4	
Cadmium	0.01	0.16	0.04	0.16	
Calcium	NA	520	210	870	
Chromium	0.05	0.22	0.11	0.41	
Cobalt	NA	0.12	0.05	0.19	
Copper	0.2	1.2	0.21	0.88	
Iron	0.3	370	110	400	
Lead	0.025	2.9	0.16	0.4	
Magnesium	NA	69	50	180	
Manganese	0.3	16	6.9	36	
Mercury	0.002	0.024			
Nickel	NA	0.26	0.16	0.37	
Potassium	NA	20	14	22	
Sodium	NA	13	21	14	
Thallium	NA		0.006		
Vanadium	NA	0.3		0.3	
Zinc	0.3	12	0.98	3.4	
[illegible] EPA Method 8260	ug/l	ug/l	ug/l	ug/l	
Toluene	5	52			
EPA Method 8270	ug/l	ug/l	ug/l	ug/l	
bis (2-Ethylhexyl) phthalate	0.005 or 0.050	57	29	27	Common lab and field contaminant
[illegible] Method 8080 PCBs	ug/l	ug/l	ug/l	ug/l	
Total PCBs	0.0001	4.9			

Notes:

1. Only compounds detected in at least one water sample are presented.
2. Blank means compound not detected. Refer to the analytical report.
3. TP-6 was collected from an underground vat and is not a groundwater sample.
4. Groundwater standards from NYCRR Part 703.

3.21 Chemical Results

A summary of the groundwater analyses are presented in Table 2. Groundwater results are contained in Appendix B. Groundwater samples were analyzed from wells OW-1 and OW-2. In addition, a liquid sample was obtained from the vat. The samples were analyzed for USEPA Method TCL 8260 (VOCs), 8270 (SVOCs), 8080 (PCBs only), and TAL metals.

The results from the vat show that PCBs and one VOC, toluene, were detected. The concentrations exceed groundwater standards. As noted above, however, this sample is not from the groundwater. Inspection of the groundwater samples from OW-1 and OW-2 do not show these compounds to be present.

VOCs, PCBs, and SVOCs were not detected in the groundwater samples from OW-1 and OW-2 with the exception of bis (2-ethylhexyl) phthalate. [Note: Bis (2-ethylhexyl) phthalate is a common lab and field contaminant, and consequently the results are not believed to be indicative of actual site contamination.]

Metals were detected in the samples from the vat and groundwater. The metals concentrations are typically higher in well OW-2 as compared to OW-1. For example, chromium and lead in the sample from well OW-2 are at concentrations two to three times greater than well OW-1. This does not necessarily imply that a metals problem exists at the site, rather it is an indication of a potential concern.

Metals in the liquid sample from the vat are generally similar to the groundwater samples.

4.00 SUMMARY AND CONCLUSION

The following conclusions have been determined from the site investigation regarding soil and groundwater sampling conducted at the Site.

1. The soils at the site consist of over ten feet of fill at certain areas of the site. The fill material is heterogeneous and consists of a mixture of the following: construction and demolition debris, sand, gravel, wood, and at TP-4, only black compressible material which appears to be a mixture of sand and ash. The black compressible material is of interest due to its apparent compressibility.

2. The Northeast wing of the Senior Housing Complex and many of the surrounding paved areas were constructed over unsuitable fill material. Excessive consolidation has occurred due to several factors: the presence of unsuitable materials, the uncompacted nature of some of the materials and the presence of underground voids.

3. The Access road at the Northeastern portion of the site was constructed over a wooden process vat which has partially failed creating a potentially dangerous condition.

4. There is soil and groundwater contamination present at the site. In general, VOCs are not of concern in the soil and groundwater based upon the testing completed.

   SVOCs, mainly PAHs, are of potential concern in the surficial and subsurface soils. The surficial soils are of concern since these soils can be contacted directly by residents. The subsurface soils are of concern in the event the soils are excavated and moved to an uncontrolled location. Excavation in the soils should be completed with care and consideration for appropriate OSHA regulations. Only one SVOCs was detected in the groundwater. However, the contaminant is considered a laboratory or field contaminant, and consequently, SVOCs are not considered a concern for groundwater.

   Metals are of potential concern in soil and groundwater. The levels of certain metals detected in soils exceed some of the published levels for soils in the Eastern USA[2].

   Groundwater levels for certain metals were higher in the apparent downgradient well as compared to the upgradient well. This suggests an increase in metals such as cadmium and chromium as groundwater traverses the site.

   PCBs were only detected in a water sample and sludge sample from the vat. The concentrations are not of immediate concern. Depending upon the intentions for the vat, it may be necessary to remove the water and sludge and have it handled according to applicable regulations.

[2]This guidance value was obtained from the NYSDEC TAGM 4046 for inactive hazardous waste sites.

5.00 RECOMMENDATIONS

S&A makes the following recommendations to the SNHA.

1. The Northeast Wing should be demolished and the existing foundations removed. If the Wing is to be replaced in the future all demolition debris should be removed to the undisturbed sand and gravel layer, which has a suitable allowable bearing capacity for residential type construction. Suitable fill such as bank run gravel should be placed in 6" layers and compacted to 95% of the maximum dry density as determined by a modified Proctor Test (ASTM D1557-91).

2. The extent of the vat at the Northeast access drive should be determined. The process vat should be pumped out and the vat and its contents removed and properly disposed of in according with applicable regulations. Suitable fill such as bank run gravel should be placed in 6" layers and compacted to 95% maximum dry density (ASTM D1557-91) and the paving replaced.

3. The areas with subsidence problems in the Southeast parking area and at the Northeast Dumpster pad need to be excavated to original undisturbed soils or to suitable fills. All demolition debris and other unsuitable material need to be removed and replaced with suitable fill such as bank run gravel. This material should be placed in 6" layers and compacted to 95% maximum dry density (ASTM D1557-91). The area should then be repaved.

4. Additional chemical testing of soil and water samples should be completed to validate the preliminary conclusions made in this report. This should include the following:
    - Survey of existing wells and groundwater level measurements to assess the groundwater flow direction.
    - Sampling and testing of groundwater samples from each well for metals.
    - Collection of three "natural" soil samples to better assess the potential for metals to be of concern at this site.
    - Collection of soil samples for SVOC (PAH only) analysis from 10 areas on-site to better assess the distribution of soil contamination with emphasis placed on vegetable gardens. This is important to assess potential risks to people residing on-site.
    - Trenching of soils along the vat to better assess the buried remains of the former Boiler House and Electrical Generation Building.

5. Additional sampling and testing should be completed if additional excavations at performed on site. Given the heterogeneous nature of the fills, it is possible that other waste materials may be encountered.

6. Completion of an assessment to evaluate the potential risk to humans on-site. This could be avoided if a sufficient quantify of "clean" fill material is imported and "contaminated" fills are buried on site or removed